

A Comparison of Interlibrary Loan Requests Received by the National Library of Medicine: 1959 and 1984

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ABSTRACT

In 1962, an analysis of interlibrary loan requests for serials filled by NLM in 1959 was published. In the twenty-five years following 1959, important changes occurred in the biomedical library community, which had a significant impact on interlibrary loan activities, including the development of MEDLARS and online searching, the Regional Medical Library (RML) network, and union listing for serials. To describe NLM's current interlibrary loan request traffic for serials and to identify any significant changes in traffic between 1959 and 1984, a comparative analysis of 1984 serial loan requests was performed, primarily by manipulation of automated request records. The changes in request traffic strongly suggest that the efforts to strengthen regional document delivery through the RML program have been successful and that NLM's collection is now used primarily as a last resort.

THE MISSION of the National Library of Medicine (NLM) is to collect, organize, preserve, and disseminate biomedical information. In support of this mission, the library has assembled one of the largest collections of biomedical literature in the world. It provides access to this collection both on site in Bethesda, Maryland, and through an international interlibrary loan service. Health professionals, researchers, students, and others who fail to obtain needed medical literature from local, regional, or other national libraries may forward their request to the National Library of Medicine.

In 1962, Kurth's *Survey of the Interlibrary Loan Operation of the National Library of Medicine* was published [1]. That report presented the results of a detailed analysis of approximately 78,000 requests for serials filled by NLM in 1959. Kurth chose to focus on serial requests, as they represented 93% of the requests filled, and thus had the heaviest impact on the NLM collection. He presented information on the serial titles being requested, the characteris-

tics of the requesting libraries, and the interrelationships between the two. Results showed that during 1959 NLM provided 1,780 libraries in the United States and abroad with 77,698 photocopies from 4,347 serial titles. In fiscal 1984 (October 1, 1983, to September 30, 1984), NLM received 142,464 interlibrary loan requests [2]. Approximately 94% of these requests were for information from serials, with only 6% from monographs—a very minor change from the 1959 distribution. In late 1984, NLM decided to study the interlibrary loan operation by analyzing the portion of the 142,464 requests that had been captured in machine-readable form. Again, because of the high percentage of requests for serials, the focus of this study was the 86,803 serial requests filled for libraries and the 4,663 requests filled for the World Health Organization (WHO). In addition to presenting the results of this survey, this report compares, to the extent possible, the 1984 interlibrary loan picture with that presented in the Kurth report.

In the twenty-five years between the Kurth report (for 1959) and the current analysis (for fiscal 1984) many important innovations have occurred in the biomedical library community. Among the most important to NLM's interlibrary loan program are MEDLARS and online database searching, the Regional Medical Library network, and increased union listing of serials.

In 1964, NLM introduced MEDLARS (Medical Literature Analysis and Retrieval System) for automated storage and retrieval of citations in *Index Medicus*. By the end of 1984, NLM was providing online access to the nearly five million citations in *Index Medicus* through MEDLINE, and to another twenty-four databases holding nearly seven million records.

In 1965 the Medical Library Assistance Act

(MLAA) was passed by Congress. This authorized federal grants for library construction, training, better library resources, and regional libraries. By 1970, NLM had provided financial support for ten existing libraries to serve as Regional Medical Libraries (RMLs) for their areas of the country. (NLM acted as an eleventh regional library.) One element of the RML function is to coordinate local and regional resource sharing so that health professionals have rapid access to needed health information. In 1982 the RML network was reconfigured into seven regions, and NLM ceased to be an RML itself. Resource sharing and document delivery remain important aspects of network activities.

Medical libraries have a long history of successful local, state, and regional union lists. In the late 1970s, NLM started SERHOLD, a national holdings database for biomedical serials that combined and augmented the many existing sources of biomedical holdings data, to support automated document request generation and routing. An interim objective was to provide union lists where they were needed to complement those produced by other organizations, and to ensure union list coverage of at least the larger biomedical collections in all parts of the United States. The SERHOLD database became operational in 1982; it has been updated annually since then. In fiscal 1984, SERHOLD contained approximately 24,000 serial titles, with holdings for about 1,500 medical libraries.

SURVEY DATA

In fiscal 1984, NLM began to maintain summary records of interlibrary loan transactions for billing purposes in an INQUIRE* database on NLM's IBM 3033 computer system. These summary records were the primary source of the data used in this study. In addition, certain information from bibliographic records in the SERIALS database and from the institutional users database, DOCUSER, was used to augment data in the summary records.

During this first year of billing for interlibrary loans, not all transactions were captured in machine-readable form. For this study, 79.4% of the total 142,464 requests received from domestic and foreign institutions in fiscal 1984 were reviewed. An additional 4,663 requests were filled

under an agreement between NLM and the World Health Organization (WHO) for provision of photocopies to developing countries. Because requests from these countries were included in the 1959 analysis, the 4,663 filled serial requests processed in fiscal 1984 have been included in this study; they were not in machine-readable form, however, so analysis of these requests has been restricted to certain areas.

In this report the term "interlibrary loan," or ILL, means not only loaning physical volumes, but also providing photocopies of articles. In fact, the substantial majority of interlibrary loan requests filled by NLM are in the form of photocopies.

OVERVIEW OF ILLS AT NLM

Although NLM has been providing loan services for over 100 years, its loan policies have undergone a succession of changes. Initially, requests from off-site users were filled directly for individual requesters as well as for libraries. Since 1957, however, requests have been accepted only from libraries or information organizations, not from individuals. Since the Regional Medical Library Network began, NLM policy has also dictated that local resources be checked before requests are sent to the National Library of Medicine.

The NLM annual reports and other internal reports reveal that from the late 1950s through 1977, the volume of interlibrary loan requests gradually increased to a peak of more than 280,000 in 1977, and then declined slowly to 204,984 in 1983. In fiscal 1984 there was a dramatic decrease in the number of interlibrary loan requests received by NLM, from 204,984 to 142,464. That was the year that NLM instituted charges for ILL service, and the 33% drop in volume is attributed to that change. At this writing, the volume of requests has again begun to increase.

In general, requests for serials are filled as photocopies, so that the journal volume itself stays in the library and remains available for other requesters, whether external or on-site. The pattern of filling ILL requests for serials as photocopies is nearly identical with that found in the Kurth study. Current data show that 78% of requests were filled as photocopies and 5% as original loans; 17% were not filled.

This differs less than 1% from the 1959 data. The earlier study also showed that 93% of the completed interlibrary loans were filled as photocopies, a figure remarkably similar to the 94% for the fiscal 1984 data.

*INQUIRE is a database management system produced by Infodata Systems, Inc., Rochester, N.Y., and licensed by NLM.

LIBRARY CATEGORIES FY 1984

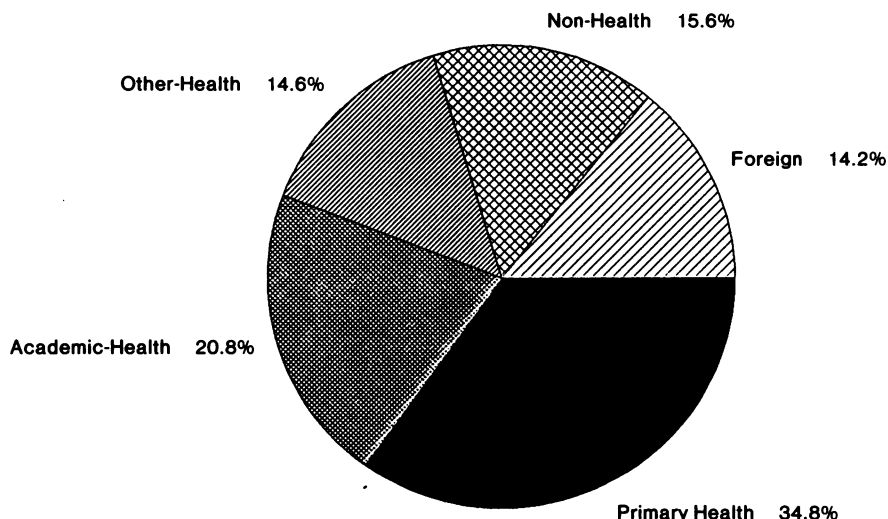


FIG. 1.—Distribution of fiscal 1984 NLM serial interlibrary loans by type of requesting library.

THE REQUESTING LIBRARIES

General Distribution

During fiscal 1984 NLM filled interlibrary loan serial requests for 3,513 different libraries, excluding institutions that submitted requests through the World Health Organization. Of that figure, 3,112 libraries (89%) were within the United States or on overseas U.S. military bases with A.P.O. or F.P.O. mailing addresses. The remaining 401 organizations (11%) were located in other countries. The total number of institutions receiving interlibrary loan service from NLM is nearly twice the number reported in the 1959 study.

In addition to the significant increase in the number of libraries receiving NLM service, the use pattern is markedly different as well. In the current study, 921 (26%) of the libraries receiving photocopies of journal articles from NLM received only one; in 1959, only 287 (16%) were in that category. Kurth divided use by libraries into three categories: "low use" (1 to 10 loans); "moderate use" (11–100 loans), "heavy use" (101 or more loans). The following chart shows the number of libraries in each category.

	Fiscal 1984	1959
Low use (1–10)	2,497 (71%)	974 (54.7%)
Moderate use (11–100)	844 (24%)	632 (35.5%)
Heavy use (>100)	172 (5%)	174 (9.8%)

It is clear that NLM is now providing interlibrary loan service to more libraries in a more distributed pattern.

Characteristics of Libraries

Figure 1 shows how serial requests filled in fiscal 1984, including those filled under the WHO agreement, are distributed among five broad categories of institutions. Nearly 35% of the photocopies were delivered to primary health care institutions in the United States; these include hospitals and clinics. Schools of medicine, dentistry, nursing and allied health, and their affiliated medical centers account for another 21%. Non-health requesters accounted for 15.6% of requests. Other health-related institutions requested another 14.6%. Foreign requests,

TABLE 1
WORLDWIDE DISTRIBUTION: NLM SERIAL
INTERLIBRARY LOANS

Area	FY 1984* ILLs (%)	1959† ILLs (%)
North America	80,020 (87)	69,080 (89)
Asia	6,515 (7)	583 (1)
South America	2,866 (3)	4,796 (6)
Europe	785 (1)	2,826 (4)
Africa	726 (1)	142 (<1)
Oceania	554 (1)	271 (<1)
Total	91,466	77,698

*Fiscal 1984 data included 4,663 requests not in machine-readable form received from WHO participating countries; they are not included in most other tables.

†Kurth report, 16.

which account for 14.2%, have not been categorized by requesting institution. A total of 13,008 photocopies were delivered to foreign requesters, 8,345 (9.1%) directly by NLM, and 4,663 (5.1%) through the World Health Organization.

Geographic Distribution

The overwhelming majority of photocopies were delivered to North American requesters; this percentage, 87%, is only slightly less than the 89% found in the 1959 study. Table 1 shows the increase in the number of filled requests delivered to Asian institutions, chiefly due to World Health Organization activity in this area. There has also been a marked decrease in the number of requests filled for Europeans and South Americans.

The distribution of filled requests in the United States, organized by the seven geographic regions of the Regional Medical Library Network, is detailed in Table 2. The heaviest use is by libraries in Region 2, which includes NLM. This heavy

volume largely reflects the use of NLM by federal government libraries in the Washington metropolitan area.

Serial Titles

The fiscal 1984 data showed that the National Library of Medicine photocopied articles from 10,269 different serial titles; of these, 6,667 were open titles and 3,602 ceased titles. In 1959, there were 4,347 serial titles used. Although this is a significant increase in titles, it must be viewed in the context of rapid growth in the medical literature during those twenty-five years. The number of serial titles in the NLM collection is approximately 63,000; in 1959, it was reported to be 37,000. In 1959, NLM had 12,862 current subscriptions to serial titles; in fiscal 1984 there were 22,294 serial titles.

In the fiscal 1984 survey, then, 16% of NLM's serial titles were used and 84% were not. This is in line with the results of the Kurth study, which found that 88% of the titles were not used in loan transactions during calendar year 1959. A further comparison shows that in the fiscal 1984 survey, of the 10,269 titles used, 3,163 (31%) were used only once; in the 1959 study, Kurth reported that of the 4,347 serial titles involved in loans, 28% were used only once.

Using the same "use" categories as for libraries above, a similar comparison shows a 10% increase in the number of titles in the "low use" range.

	Fiscal 1984	1959
Low use (1-10)	8,124 (79%)	3,001 (69%)
Moderate use (11-100)	2,105 (20.5%)	1,185 (27.3%)
Heavy use (>100)	42 (0.5%)	161 (3.7%)

TABLE 2
REGIONAL DISTRIBUTION: NLM SERIAL INTERLIBRARY LOANS FY 1984

Regions	Libraries	ILLs	Average ILLs/Library
1. Greater Northeast	873	9,682	11
2. Southeastern/Atlantic Region	749	35,790	48
3. Greater Midwest Region	641	11,077	17
4. Midcontinental Region	298	7,880	26
5. South Central Region	158	4,608	29
6. Pacific Northwest Region	222	4,554	21
7. Pacific Southwest Region	380	4,863	13
Total	3,321	78,454	24

TABLE 3
DATE DISTRIBUTION: NLM SERIAL INTERLIBRARY
LOANS FY 1984

Decade*	ILLs (%)	Running %
1980s	56,328 (65)	65
1970s	19,766 (23)	88
1960s	4,741 (5)	93
1950s	1,860 (2)	95
1940s	802 (1)	96
1930s	681 (1)	97
1920s	435 (1)	97
1910s	396 (<1)	98
1900s	377 (<1)	98
1890s	414 (<1)	99
1880s	291 (<1)	99
1870s	121 (<1)	99
Date not identified	556 (1)	100

*The number of filled requests for pre-1870 material was not representative, as most were not in machine-readable form in fiscal 1984.

Serial Titles Indexed

As noted above, one of the significant developments between the Kurth study and fiscal 1984 was the introduction of MEDLARS. *Index Medicus* in its printed form is widely distributed throughout the world and is heavily used for article-level access to significant biomedical journals. *Index Medicus* citations from 1966 to the present as well as citations to nursing and dental literature published in other indexes are available online in MEDLINE and its backfiles. In addition to *Index Medicus*, there are other abstracting and indexing publications pointing to journal articles in the health-related literature. Included among them are *Biological Abstracts*, *Chemical Abstracts*, *Excerpta Medica*, *Hospital Literature Index*, *International Nursing Index*, *Psychological Abstracts*, and *Science Citation Index*.

Of the 10,269 titles used in the 1984 study, 3,253 (32%) are indexed in *Index Medicus*, with another 3,686 (36%) indexed in one of the other publications listed above. Kurth reported that in 1959, 34% of all the loaned titles were in *Index Medicus*. It should be noted that of the approximately 63,000 titles in NLM's collection, 3,679 are currently being indexed for *IM* or have been indexed for that publication at some time between 1970 and the present. Fully 88% of these titles were used for interlibrary loan in the fiscal 1984 survey.

Analyzing the filled serial requests rather than the number of titles highlights the significance of access through indexes. Of the 84,314 machine-

readable records complete enough for analysis, 50,497 (60%) are from journals indexed in *Index Medicus*. An additional 24,579 (29%) are indexed in one of the other major indexing publications. Only 9,242 (11%) of the filled requests were in serial titles not identified as being indexed.

Time Period of Serials Used

As the NLM has acquired its collection over 150 years, the collection contains complete runs of a great number of serial titles. Nevertheless, the data in Table 3 show that fully 95% of requests filled are for journal articles from 1950 to the present, with the period from 1970 to the present accounting for 88% of the overall volume. At the same time, the data show that requests for serial literature extend over a long period of time.

Most Used Titles

In the 1984 study, the top 300 titles accounted for 22,030 loans, or 25% of the total. Kurth reported that in 1959, 53% of the total loans were accounted for by the top 300 titles. The most requested titles reported in the Kurth study are shown in Table 4.

Not one of these journals appears in the top ten in the current study: *Lancet* ranks 26th, *British Medical Journal* ranks 109th, *JAMA* is 154th, *New England Journal of Medicine* is 239th. The remaining six titles do not appear in the top 300 titles in the fiscal 1984 survey.

The twenty-five most-requested titles in 1984 are shown in Table 5.

Country of Publication

Though fully one third of the filled serial requests were taken from journals published in the

TABLE 4
MOST USED TITLES: NLM SERIAL INTERLIBRARY
LOANS 1959

Title	ILLs
1. <i>Lancet</i>	721
2. <i>British Medical Journal</i>	632
3. <i>American Journal of Physiology</i>	627
4. <i>Journal of the American Medical Association (JAMA)</i>	622
5. <i>Journal of Biological Chemistry</i>	472
6. <i>Proceedings of the Society for Experimental Biology and Medicine</i>	461
7. <i>New England Journal of Medicine</i>	455
8. <i>Journal of Clinical Investigation</i>	407
9. <i>Journal of Experimental Medicine</i>	381
10. <i>Journal of Dental Research</i>	368

TABLE 5
MOST USED TITLES: NLM SERIAL INTERLIBRARY
LOANS FY 1984

Title	ILLs
1. <i>Clinical and Experimental Obstetrics and Gynecology</i>	362
2. <i>Italian Journal of Neurological Sciences</i>	300
3. <i>European Journal of Gynaecological Oncology</i>	265
4. <i>Medicina Clinica</i>	257
5. <i>Nursing</i>	245
6. <i>Progress in Clinical and Biological Research</i>	234
7. <i>Nursing Focus</i>	231
8. <i>Gan To Kagaku Ryoho</i>	219
9. <i>Cost Containment</i>	217
10. <i>Ricerca in Clinica e in Laboratorio</i>	194
11. <i>Journal of the Association of Physicians of India</i>	179
12. <i>Caring</i>	170
13. <i>Health Visitor</i>	165
14. <i>Journal of the American Paraplegia Society</i>	164
15. <i>Journal of the American College of Cardiology</i>	150
16. <i>Emergency Department News</i>	145
17. <i>Radiology Management</i>	145
18. <i>Annals of the Academy of Medicine, Singapore</i>	144
19. <i>Infection Control and Urological Care</i>	144
20. <i>European Journal of Clinical Microbiology</i>	142
21. <i>Texas Hospitals</i>	141
22. <i>Brain and Development</i>	136
23. <i>Cephalagia</i>	136
24. <i>Hospital Trustee</i>	133
25. <i>Nita</i>	131

United States, it is important to note that in this 1984 survey, requests were filled from journals published in a total of 102 countries.

Kurth reported data on the country of publication for the 300 most frequently used titles. Twenty-six countries published these most-requested journals. In fiscal 1984, forty-one countries were responsible for the 300 most frequently used titles. Japan, which published only one of the top titles in 1959, moved up to third place in 1984, with 582 of the titles requested (Table 6).

Languages

Languages of publication for the 300 most-used titles in fiscal 1984 data were compared with the 1959 reported data. Again, as with country of publication, the languages show a wider distribu-

tion in 1984 than in 1959. The most striking change relates to material published in Japanese and Chinese. Neither of these languages appeared in the data for 1959, but in fiscal 1984, Japanese ranked second on the list and Chinese ranked seventh. The earlier study reported that 91% of the 300 most-used titles and 92% of the articles provided were published in English, German, and French. The current data show a relative decrease—73% of the titles and 75% of the articles provided are published in those three languages. Requests for Japanese and Russian articles now exceed requests for German and French articles.

SUMMARY AND CONCLUSION

The interlibrary loan requests to the National Library of Medicine in fiscal 1984 were primarily for articles in serials. NLM filled 78% of these requests as photocopies in fiscal 1984, remarkably close to the 77.8% in 1959. Findings reported here, however, show significant changes in the distribution of libraries using NLM and in the serial titles requested. Other patterns continued unchanged,

TABLE 6
COUNTRY OF PUBLICATION: NLM SERIAL
INTERLIBRARY LOANS FY 1984

Country of Publication	Serial Requests	Titles Used
1. United States	29,215	3,820
2. England	8,370	911
3. Japan	6,064	582
4. Germany, West	5,879	720
5. Italy	4,166	415
6. France	3,310	523
7. Netherlands	2,616	293
8. U.S.S.R.	2,446	218
9. Switzerland	2,206	315
10. India	1,730	179
11. Canada	1,663	160
12. Australia	1,390	113
13. Poland	1,089	113
14. Spain	1,033	109
15. Germany, East	911	118
16. Czechoslovakia	876	81
17. China	828	51
18. Denmark	811	93
19. Belgium	770	105
20. Sweden	698	96
21. Romania	581	65
22. Brazil	470	96
23. Scotland	456	58
24. Hungary	450	70
25. Yugoslavia	416	61

such as the great percentage of requests for material published in the last few years.

The number of libraries using the NLM collection has doubled, with fewer libraries categorized as heavy users, and more libraries as infrequent users. NLM is today providing service to a much larger number of health sciences libraries than in the earlier study. These findings can be linked to the changes in NLM's interlibrary loan policies and procedures in the last twenty-five years, its support of the now nineteen-year-old Regional Medical Library Program, the strengthening of hospital libraries, the increase in the number of hospital library consortia, and the development of strong collections by academic health sciences libraries throughout the country.

Both in the 1959 study and the current one, the data show that only a small percentage of the overall serial collection was used to provide interlibrary loan service—12% in 1959, 16% in fiscal 1984. *Index Medicus* and MEDLINE, along with other abstracting and indexing publications, are important tools for identifying the literature, as evidenced by the high percentage of loans for titles indexed.

It is not surprising to find that the highest use (95%) of the serials collection is for articles published since 1950. The nature of medical research and clinical practice dictates that the most current information be used. Except in rare cases, the older material is used for historical research or background information.

The characteristics of the most frequently requested serial titles strongly suggest that the efforts to strengthen regional document delivery

systems and encourage the use of local resources first, with NLM as a last resort, have been successful. The list of the most frequently requested journals no longer includes the most widely read medical journals, such as the *Journal of the American Medical Association* and the *New England Journal of Medicine*, but includes many foreign titles not commonly held in other U.S. health sciences libraries.

The National Library of Medicine is currently implementing DOCLINE, its automated request routing and referral system. When the system is fully implemented, an estimated 2,000 health sciences libraries in the Regional Medical Library Network will input interlibrary loan requests into the NLM system and have serial requests automatically routed to local and regional libraries before they are referred to NLM as the last resort. This system should further support the already successful efforts to ensure effective decentralized interlibrary loan service to health professionals in the United States.

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